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Comparisons of urodynamic and clinical findings between those positive and negative sUPP in women with USI

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Hypothesis / Aims of study

Urodynamic stress incontinence (USI) is a prevalent condition among women, characterized by involuntary urine leakage during activities that increase intra-abdominal pressure, such as coughing, sneezing, or physical exertion.[1] Stress urethral pressure profile (sUPP) measurement is an important diagnostic tool used during urodynamic studies to assess urethral function. In some women with USI, involuntary urine leakage occurs during this measurement, yet the clinical and urodynamic significance of this leakage remains unclear.[2] This study aims to elucidate the differences in clinical and urodynamic findings between women with USI who experience involuntary urine leakage during sUPP measurement and those who do not.

Study design, materials and methods

Between July 2009 and December 2023, a total of 481 women with USI were included and divided into positive and negative sUPP groups. The medical records, including urodynamic study (UDS), 3-day bladder dairy [3-5] and questionnaires regarding lower urinary tract symptoms (LUTS) were reviewed. Wilcoxon rank sum test or chi-square test were used for statistical analysis, as appropriate. Linear regression analysis was performed to adjust for the presence of overactive bladder (OAB) syndrome. A *p* < 0.05 was considered statistically significant.

Results and interpretation

Subjectively, the percentage of stress urinary incontinence was similar in the two groups, but overactive bladder syndrome (OAB) was more prevalent in positive sUPP group, which also revealed more bladder oversensitivity and smaller bladder capacity in UDS objectively. There was no difference in all the subjective questionnaires between the two groups. However, the positive sUPP group revealed higher episodes of urgency, daytime frequency, incontinence, and nocturia derived from its 3-day bladder diary record, compared to the negative sUPP group. Furthermore, the positive sUPP group revealed a larger pad weight and a lower maximum urethral closure pressure (MUCP) in UPP data. Adjusted by OAB, the positive sUPP group still has higher episodes of urgency, daytime frequency, incontinence, and nocturia, smaller bladder capacity, a lower MUCP, and a longer functional pressure profile length, compared to the negative sUPP group.

Table Comparisons between positive and negative stress urethral pressure measurement in women with urodynamic stress incontinence.

Variables	Positive sUPP (n=175)	Negative sUPP (n=306)	<i>p</i> ^a	Leak coeff.	95% CI	<i>p</i> ^b
Age (years)	65.0±11.3	65.4±11.9	0.466	-	-	-
Parity	3.2±2.6	3.0±1.5	0.849	-	-	-
OAB	125 (71)	184 (60)	0.013	-	-	-
SUI	120 (69)	232 (76)	0.084	-	-	-
PPBC	3.8±1.6	3.8±1.5	0.689	-	-	-
USS	2.3±1.3	2.2±1.3	0.442	-	-	-
OABSS	7.6±3.8	7.5±4.0	0.916	-	-	-
UDI-6	6.9±4.2	7.4±4.4	0.125	-	-	-
IIQ-7	7.8±6.0	8.0±6.2	0.868	-	-	-
KHQ						
GHP	52±23	51±23	0.546	-	-	-
Incontinence impact	39±26	36±25	0.421	-	-	-
Role limitations	47±34	44±33	0.319	-	-	-
Physical limitations	52±33	48±33	0.329	-	-	-
Social limitations	35±33	34±33	0.608	-	-	-
Personal relationship	23±34	16±25	0.463	-	-	-
Emotions	42±33	39±33	0.499	-	-	-
Sleep/energy	45±32	44±29	0.880	-	-	-
Severity measures	43±31	44±31	0.935	-	-	-
Frequency	2.4±1.3	2.4±1.2	0.394	-	-	-
Nocturia	2.5±1.2	2.4±1.2	0.420	-	-	-
Urgency	2.5±1.4	2.3±1.3	0.088	-	-	-
Urge incontinence	2.2±1.5	2.1±1.4	0.464	-	-	-
Stress incontinence	2.3±1.4	2.3±1.4	0.906	-	-	-
Nocturnal enuresis	0.9±1.2	0.8±1.1	0.756	-	-	-
Intercourse incontinence	0.5±0.9	0.5±0.8	0.274	-	-	-
Waterworks infection	1.2±1.4	1.2±1.3	0.683	-	-	-
Bladder pain	0.9±1.2	0.9±1.1	0.454	-	-	-
Bladder diary (3 days)						
Urgency	9.6±11.2	5.8±9.3	<0.001	3.3	1.4-5.1	0.001
Daytime frequency	24.7±12.1	16.7±12.9	<0.001	7.7	5.3-10.1	<0.001
Incontinence	3.8±7.5	2.2±6.4	<0.001	1.5	0.2-2.7	0.024
Nocturia	7.4±4.7	5.3±4.7	<0.001	1.9	1.0-2.8	<0.001
Urodynamic study						
Pad weight (g)	36±37	31±42	0.002	2.8	-4.7~-10.3	0.466
Qmax (ml/s)	19±10	18±10	0.151	-	-	-
Voided volume (ml)	234±247	228±131	0.455	-	-	-
PVR (ml)	45±30	47±41	0.824	-	-	-
Strong desire (ml)	208±69	234±65	<0.001	-20	-32~-9	0.001
PdetQmax (cmH ₂ O)	24±21	24±15	0.820	-	-	-
MUCP (cmH ₂ O)	40±26	51±27	<0.001	-11	-16~-6	<0.001
PTR (%)	95±35	99±53	0.363	-	-	-

Conclusions

Women with USI who exhibit involuntary urine leakage during stress urethral pressure measurement have more severe LUTS, poorer urethral function, and smaller bladder capacity compared to those without leakage.

References

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